Problem 11: Count to 10

Points: 25

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Problem Background

When testing software or hardware, it's considered a "best practice" to test every possible situation to prove that the code or device is stable under any condition it might come across. For example, if we have a chip with eight LEDs, we might want to light up those LEDs in every combination to make sure they function properly. This is essentially an 8-bit binary counter, displaying each number from 0 to 255.

Problem Description

In this problem, you will need to generate test data for a binary counter like that described above. You will be provided with the number of bits to use for your counter, and will need to generate a list of all binary numbers with at most that number of bits in numerical order.

Sample Input

The first line of your program's input, **received from the standard input channel**, will contain a positive integer representing the number of test cases. Each test case will include a single line with a positive integer, representing the number of bits to use.

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Sample Output

For each test case, your program must output a list of binary numbers, ranging from 0 to the maximum value with the indicated number of bits, inclusive. Numbers must be listed one per line, in numerical order. Include any leading zeros up to the required bit length.

000
001
010
011
100
101
110
111